CLAIMS

1. A method for producing a solid electrolytic capacitor comprising a metal material having thereon a dielectric film and a solid electrolyte formed on a desired position of the dielectric film, the metal material having valve action, wherein the method comprises the step of coating a masking material solution that infiltrates into the dielectric film and forms a masking layer on the infiltrated portion.

2. A method for producing a solid electrolytic capacitor comprising a metal material having thereon a dielectric film and a solid electrolyte formed on a desired position of the dielectric film, the metal material having valve action, wherein the method comprises the step of coating a masking material solution that infiltrates into the dielectric film and forms a masking layer on the infiltrated portion, wherein a masking resin that has infiltrated into the dielectric film and solidified during the coating step prevents infiltration of a solid electrolyte formed in a subsequent step.

3. The method for producing a solid electrolytic capacitor as claimed in claim 2, wherein the concentration of the solid electrolyte in the dielectric film where the masking resin has infiltrated in the step of coating a masking material solution is not higher than a detection limit value attained by use of

an electron probe microanalyser.

4. The method for producing a solid electrolytic capacitor as claimed in any one of claims 1 to 3, wherein a plurality of solid electrolytic capacitor substrates are fixedly attached to a metallic guide in a cantilever fashion, and a rotating disk is brought into contact with the substrates at a desired position at a predetermined pressing force while the metallic guide is moved, thereby coating a masking material solution, which is fed from masking-material-solution supply means to the coating surface of the rotating disk, on opposite surfaces and opposite side surfaces of the solid electrolytic capacitor substrate at a desired position to form the masking layer.

5. The method for producing a solid electrolytic capacitor as claimed in claim 4, wherein the relative position between the metallic guide and the rotating disk is inverted to thereby apply the masking material solution to opposite surfaces and opposite side surfaces of the substrate fixedly attached to the metallic guide.

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6. A method for producing a solid electrolytic capacitor comprising a metal material having thereon a dielectric film and a solid electrolyte formed on a desired position of the dielectric film, said metal material being cut into a predetermined shape and having valve action, as claimed in claim 1, wherein the method comprises the step of coating a masking

material solution on said metal material to form a first masking layer and the step of coating a masking material solution on said metal material to form a second masking layer, wherein at least the step of forming a second masking layer causes the infiltration of the masking material solution into the dielectric film and the formation of the masking layer on the infiltrated portion.

7. A method for producing a solid electrolytic capacitor comprising a metal material having thereon a dielectric film and a solid electrolyte formed on a desired position of the dielectric film, said metal material being cut into a predetermined shape and having valve action, wherein the method comprises:

a step of linearly coating a masking material solution around the entire circumference in the region undertaking the boundary in the application of electrochemical forming onto said metal material, and heating the solution to form a first masking layer;

a step of subjecting an area where a solid electrolyte is formed later to electrochemical forming, the area being defined by the first masking layer on said metal material;

a step of further linearly coating a masking material solution around the entire circumference in the region at a predetermined distance from said first masking layer on said

electrochemically formed metal material, and heating the solution to form a second masking layer;

a step of forming a solid electrolyte in the area exclusive of the space between said first masking layer and said second masking layer out of the area subjected to said electrochemical forming; and

a step of cutting said metal material in the space between said first masking layer and said second masking layer.

8. The method for producing a solid electrolytic capacitor as claimed in any one of claims 1 to 7, wherein a solution of a heat resistant resin or a precursor thereof is used as the masking material solution.

9. The method for producing a solid electrolytic capacitor as claimed in claim 8, wherein the solution of a heat resistant resin or a precursor thereof is a low molecular weight polyimide solution or polyamic acid solution capable of being solidified by heating.

10. The method for producing a solid electrolytic capacitor as claimed in claim 8 or 9, wherein the masking material solution further contains silicone oil, silane coupling agent or polyimidesiloxane.

11. The method for producing a solid electrolytic capacitor as claimed in any one of claims 1 to 7, wherein the metal foil material having valve action is a metal material selected from

the group consisting of aluminum, tantalum, niobium, titanium, zirconium and an alloy thereof.

12. The method for producing a solid electrolytic capacitor as claimed in any one of claims 1 to 7, wherein the solid electrolyte is a polymer solid electrolyte containing as a repeating unit at least one of a divalent group of any one of pyrrole, thiophene, aniline and furan, or any substituted derivative thereof.

13. The method for producing a solid electrolytic capacitor as claimed in claim 12, wherein the solid electrolyte contains a polymer of 3,4-ethylenedioxythiophene.

14. The method for producing a solid electrolytic capacitor as claimed in claim 12 or 13, wherein the solid electrolyte further contains a dopant of an arylsulfonic salt.

15. A solid electrolytic capacitor comprising a metal material having thereon a dielectric film and a solid electrolyte formed on a desired position of the dielectric film, the metal material having valve action, wherein said solid electrolytic capacitor comprises a structure in which a masking material solution has infiltrated into said dielectric film and forms a masking layer on the infiltrated portion of the dielectric film, so that the solid electrolyte is prevented from infiltrating into the dielectric film where the masking material solution has infiltrated and masked by the masking

layer formed on the infiltrated portion.

16. The solid electrolytic capacitor as claimed in claim 15, wherein the masking layer is formed using a masking material solution of a heat resistant resin or precursor thereof.

17. The solid electrolytic capacitor as claimed in claim 15, wherein the concentration of the solid electrolyte in the dielectric film where the masking material solution has infiltrated is not higher than a detection limit value attained by use of an electron probe microanalyser.

18. A method for coating a masking agent, comprising the steps of fixedly attaching a plurality of solid electrolytic capacitor substrates to a metallic guide in a cantilever fashion, and bringing a rotating disk into contact with the substrates at a desired position at a predetermined pressing force while the metallic guide is moved, thereby coating a masking material solution, which is fed from masking material solution supply means to the coating surface of the rotating disk, to opposite surfaces and opposite side surfaces of the solid electrolytic capacitor substrate at a desired position.

19. The method for coating a masking agent as claimed in claim 18, wherein the relative position between the metallic guide and the rotating disk is inverted to thereby apply the masking material solution to opposite surfaces and opposite side surfaces of the substrate fixedly attached to the metallic

guide.

20. An apparatus for coating the masking agent to opposite surfaces and opposite side surfaces of the solid electrolytic capacitor substrate (12) at a desired position, comprising: a metallic guide (11) to which a plurality of solid electrolytic capacitor substrates (12) are fixedly attached in a cantilever fashion; means for moving said metallic guide; a rotating disk (13) which comes into contact with the substrates (12) at a desired position at a predetermined pressing force; means (14) for feeding to the coating surface of said rotating disk (13) a solution which contains the masking material; and a scraper (15) for cleaning the coating surface of said rotating disk (13).

21. The apparatus for coating a masking agent as claimed in claim 20, wherein the relative position between the metallic guide and the rotating disk is inverted to thereby apply the masking material solution to opposite surfaces and opposite side surfaces of the substrate fixedly attached to the metallic guide.

22. The apparatus for coating a masking agent as claimed in claim 20, wherein two rotating disks are employed, and either one of the two rotating disks is dedicated to coating the masking material solution to reversal surfaces of the substrates fixedly attached to the inverted metallic guide.

23. The apparatus for coating a masking agent as claimed in claim 20, wherein two rotating disks are disposed on opposite sides with respect to the substrates fixedly attached to the metallic guide, thereby coating the masking material solution concurrently to opposite surfaces and opposite side surfaces of the substrate.

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24. The apparatus for coating a masking agent as claimed in any one of claims 20 to 23, wherein the substrate is formed of a valve-acting metal, and the coating surface of the rotating disk comes into contact with the substrates at a pressing force which does not exceed the elastic limit of the substrate.

25. The apparatus for coating a masking agent as claimed in any one of claims 20 to 23, wherein the rotating disk is formed of a steel material or ceramic material.

26. The apparatus for coating a masking agent as claimed in any one of claims 20 to 25, wherein the scraper is in the form of a blade which makes line contact with the coating surface of the rotating disk and which is formed of a resin or a steel softer than the material of the rotating disk.

27. The apparatus for coating a masking agent as claimed in any one of claims 20 to 26, wherein a wiping material (16) comprising resin fiber soaked with an organic solvent and/or water is disposed downstream of the scraper.

28. The apparatus for coating a masking agent as claimed in

Subject any one of claims 20 to 27, wherein means (14) for feeding the masking agent comprises a continuous quantity dispenser and a tubular member.

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